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DECONTAMINATION OF CONTRACTOR PROVIDED TOOLS, EQUIPMENT, AND MATERIAL

PART I GENERAL

1.1 SCOPE

A. Preventative measures for and decontamination of Contractor provided tools, equipment (including vehicles), and material to a level that permits removal from an enclosure/work zone, restricted reuse, or unrestricted release. This Section includes, but is not limited to:

1. Preventative measures/waste minimization,
2. Decontamination area requirements,
3. Methods of decontamination activities,
4. Control of effluent and waste management activities, and
5. Relocation, reuse, and release activities for tools, equipment, and material.

B. Project Conditions and Requirements:

1. All facilities, unless expressly noted in Part 6 of the IFB/RFP, shall be considered contaminated with radioactive material.

2. All items are considered potentially contaminated if they have been used or stored in Controlled Areas that could contain unconfined radioactive material.

3. The Contractor shall establish a holding/inspection area to allow Fluor Daniel Fernald (FDF) to perform tool and equipment radiological surveying.

   a. The holding/inspection area shall be arranged such that routine access is prevented by means of fencing and/or barrier tape with appropriate posting to identify that the items contained are being held for survey. Also, the area shall be off limits to individuals other than FDF/Contractor radiological survey personnel.

   b. Only those items which meet the requirements (as described in this Section) for leaving the work zone should enter the inspection area.

4. The Contractor should assume that extensive dismantlement and an aggressive decontamination effort will be required to achieve unrestricted release of items that have come in contact with radioactive material or were used in contamination areas. Based on past experience using the best available technologies, decontamination and survey access requirements to meet the release criteria may be difficult to achieve.

5. Hand and portable tools used in controlled areas for performance of the subcontract are to be considered expendable as specified in Part 4 IFB/RFP, Special Terms and Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED (SC-27).

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1.2 RELATED SECTIONS

Work related to this Specification Section shall also be accomplished in accordance with the following Sections:

A. Section 01120 - Debris/Waste Handling Criteria,
B. Section 01517 - Removing/Fixing Radiological Contamination, and
C. Section 15067 - Ventilation and Containment.

1.3 REFERENCE MATERIALS

A. Part 4 of IFB/RFP, Special Terms and Conditions, DISPOSITION OF CONTAMINATED TOOLS, EQUIPMENT, AND MATERIALS (SC-27)
B. Part 6 of IFB/RFP, Scope of Work
C. Part 7 of IFB/RFP, Safe Work Plan Requirements

1.4 REFERENCES, CODES, AND STANDARDS

A. United States Department of Energy (DOE):

1. DOE Order 5400.5, Radiation Protection of the Public and the Environment
2. DOE/EH-0256T, Radiological Control Manual, April 1994
3. DOE/EM-0142P, Decommissioning Handbook, Chapter. 9, Mar. 1994

B. 10CFR835 Occupation Radiation Protection

1.5 SUBMITTALS

A. The Contractor must provide FDF with a list of all tools, vehicles, equipment and material to be brought onsite which have been used in conjunction with radioactivity in the past including such information as:

1. Previous use of the equipment,
2. Dates of use,
3. Levels of contamination, and
4. Radioisotopes involved.

This list must be submitted as soon as known but no less than 30 days in advance of bringing the item onsite. FDF reserves the right to reject the Contractor's request to bring these items on site. Any tools or equipment contaminated with a radioactive material greater than 1 percent enriched uranium or thorium-232 will be rejected. Thorium contaminated tools and equipment may only be used in a thorium contaminated area.

B. The Contractor shall submit the manufacturer's technical information for any decontamination or contamination controlling agents for compliance review prior to use. This information shall include:

1. Material to be used,
2. Intended use,
3. Application instructions, and
4. MSDS Sheets.

C. Before start of decontamination work, the Contractor shall submit a Safe Work Plan addressing tool and equipment decontamination for compliance review in accordance with Part 7 IFB/RFP, Contractor Safe Work Plan Format Requirements, describing the following:

1. Preventative measures to be employed,
2. The design and construction of the decontamination area,
3. The methods to be utilized for decontamination (see Article 3.1.C of this Section),
4. The methods and equipment for controlling and handling effluent and/or secondary waste produced during decontamination activities, and
5. Plans for relocating, reusing, or releasing tools and equipment.

PART II PRODUCTS

2.1 CONTRACTOR PROVIDED TOOLS AND EQUIPMENT

A. The Contractor shall furnish all equipment, tools, and material required to perform the work described in the subcontract except where the contract explicitly states FDF will provide the item.

1. The Contractor shall deliver approved decontamination and contamination control materials in original, new and unopened containers bearing the manufacturer's label, and the following information:

a. Name or title of material,
b. Manufacturer's stock number and date of manufacture,
c. Manufacturer's Name, and
d. MSDS Sheets.

2. All possible shipping and packing materials will be removed upon receipt at the site prior to entering the controlled area to minimize contaminated waste generation.

B. For the purposes of meeting the "As Low As Reasonably Achievable" (ALARA) goal for tools, equipment, and materials, it is expected that:

- All reasonable efforts are to be used to control residual contamination to the extent that there is no detectable contamination on items that were free of contamination prior to use, or

- There is no increase in the level of contamination on items that were previously contaminated.

The ALARA efforts include, but are not limited to, the following:

1. Protective measures prior to use of items,
2. Preventative measures while items are being used, and

3. Decontamination upon completion of work activities.

C. In support of the ALARA initiative, all Contractor furnished tools, vehicles, equipment, and material may be inspected for radioactive contamination by FDF personnel prior to initial entry and upon removal from the radiological controlled area.

PART III EXECUTION

3.1 APPLICATION

A. Prevention of or Minimizing Contamination:

1. The Contractor shall plan and coordinate all work to minimize exposure of equipment, tools, and vehicles to potential radioactive contamination. Equipment shall be located in the area with the least potential for contamination. For example, locate equipment outside the facility with leads, hose lines, etc. wrapped and run to the interior of the facility. Typical examples of equipment where this approach should be used include air compressors, high pressure hydroblasters, welders, generators, oxy-acetylene cylinders, and battery chargers.

2. It is the Contractor's responsibility to evaluate materials, tools and equipment for ease of decontamination and disassembly that may be required for decontamination prior to use on-site. Use of unrestricted release items (i.e., those other than expendable as defined in Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT, TOOLS, AND MATERIALS THAT HAVE BECOME CONTAMINATED) should incorporate appropriate precautions to prevent contamination which should be implemented prior to and during use. Examples of precautionary measures may include the following which are expected to be implemented as described in the Safe Work Plan:

   a. Internal combustion equipment subject to contamination should make use of pre-filters or have a separate source of outside air on the intake.

   b. High volume air handling equipment such as blowers, compressors, etc., shall have a filtered inlet to minimize the potential for internal contamination due to build up of low level radioactivity.

   c. The Contractor is prohibited from bringing electrical driven mobile equipment to the FEMP (e.g., fork-lifts) except where only electric driven equipment is available.

   d. Protective sheathing/covers, strippable coatings, or protective caps should be used to minimize the potential for contamination (e.g., coating the buckets of man lifts or other walking/standing surfaces). In addition, all openings on equipment, tools, or vehicles that may permit contamination of inaccessible or difficult to clean areas shall be covered and protected.

3. If encapsulants, sealants and/or coatings are utilized during the project, the Contractor shall be responsible for protecting their tools and equipment from over spray. In addition, the

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Contractor shall ensure that the encapsulant, sealant and/or coating can be readily removed during decontamination activities, if necessary.

B. Decontamination Area Requirements:

1. Tools and equipment utilized inside an enclosure/building may be decontaminated at an existing indoor debris cleaning location.

2. The following are examples of options for establishing outdoor decontamination areas:

a. Utilize an existing concrete pad with run-on and run-off controls.

b. Construct a temporary containment area. Containment must have a bermed perimeter to ensure run-off control. An example of acceptable containment is Herculite with sandbag underlayment perimeters on grade without penetrations. Containment used must be adequate to maintain its integrity.

C. Methods of Decontamination Activities:

1. Where decontamination is needed, the Contractor shall at a minimum use the following as applicable:

a. Dry cleaning,
b. Steam cleaning, or
c. High pressure, hot water hydroblasting (may be used in conjunction with abrasive techniques and approved decontamination agents) with a minimum of 1,000 psi and HEPA vacuuming.

2. When selecting a decontamination technique other than those identified in C.1 above, consideration should be given to those technologies which minimize radiological airborne emissions, secondary wastes, and tool or equipment damage.

3. As an alternative to decontamination, replacement of contaminated components shall be in accordance with the requirements of Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS, THAT HAVE BECOME CONTAMINATED (SC-27).

a. The contaminated components are subject to the cleaning criteria stated in Article 3.2.B of this Specification Section.

b. The contaminated components will be managed and handled per Specification Section 01120 and Part 6 of the IFB/RFP subsequent to the cleaning as directed by FDF.

D. Control of Effluent and Waste Management Activities:

1. The Contractor shall control and collect all waste and effluent generated while removing and/or fixing contamination in accordance with the requirements listed in Part 7 IFB/RFP, and Specification Sections 01517 and 01120.

2. Management of wastes generated during decontamination activities shall be in accordance with Specification Section 01120 and the Waste Management Plan located in Part 6 of the IFB/RFP.

E. Relocation, Reuse, and Release of Tools, Equipment, and Material:

1. The Contractor shall perform all decontamination and surveying activities required to verify that the surface contamination limits identified in Table 1 of this section are not exceeded. FDF shall perform final verification surveying.

2. The Contractor shall provide a minimum of 24 hours prior notice to FDF of intent to remove tools and equipment from the work area.

3. Release of tools, equipment, and material from Contamination Areas to the Controlled Area:

   a. If removable contamination in excess of the limits of Table 1 is present on the tools, equipment or material, then the items must remain in the contamination area for decontamination or the item must be contained such that no contaminated surfaces of the item are accessible without disassembling the equipment or breaching the containment.

   b. Examples of acceptable containment include plastic wrapping, yellow Herculite wrapping, or a sealable hard container. However, the containment used must be adequate to maintain its integrity considering the weather, conditions of storage, and the methods or conditions of transport.

   c. If the removable contamination limits are met but the total (fixed plus removable) limit is exceeded, the item may be labeled or identified as radioactive material by FDF and released to the Controlled Area.

4. Unrestricted Release Criteria:

   Tools and equipment with detectable radioactivity may be released from the controlled area with the approval of a FDF Material Release Evaluator if all of the following have been met:

   a. Both removable and total surface contamination (including contamination on and under any coating) are in compliance with the levels given in Table 1 and that the item has been subjected to the ALARA process described in Article 2.1.B of this Specification Section.

   b. All areas must be readily accessible for survey for residual radioactivity including proper surface counting geometry to allow for accurate quantification. Items with inaccessible areas which are likely to be contaminated but are of such size, construction, or location as to make them inaccessible for survey shall be assumed to exceed the limits for release. The item must either be disassembled to permit an adequate survey to certify that internal contamination is at or below the limits of Table 1, or well documented process knowledge can be applied to provide confidence that contamination in inaccessible areas is not probable. In evaluating the potential for contamination in inaccessible areas, consideration will be given to where the item was

used on site and preventative measures taken prior to use, such as coverings, wrappings, air intake filters, etc.

c. Upon approval from FDF, the Contractor shall remove the tools, equipment, and/or materials off-site within eight hours.

5. Release to an Off-Site Licensed Facility:

a. If the Contractor possesses the appropriate license to receive, possess, use, and transfer the equipment, tools, material, or vehicles with radioactive contamination, Contractor may elect to remove such items from the site in lieu of decontamination. The responsibility of complying with all state, local and federal regulations during the packaging, shipping, and receipt of the equipment shall be the responsibility of the Contractor. The Contractor shall submit a copy of the license and applicable procedures to FDF for compliance review prior to removal of the contaminated equipment. A copy of all Bills of Lading shall be submitted to Fluor Daniel Fernald prior to shipment.

b. The Contractor is to provide 24 hours notice to FDF prior to shipping radioactive tools, equipment, and/or material.

3.2 UNSUCCESSFUL/IMPRACTICAL CONTRACTOR DECONTAMINATION

A. If FDF determines that the contractor has implemented the requirements of this Section and the Safe Work Plan and the Contractor's decontamination efforts are unsuccessful or decontamination is not practical (as identified below), refer to Part 4 IFB/RFP, Special Terms And Conditions, DISPOSITION OF CONTRACTOR PROVIDED EQUIPMENT AND TOOLS THAT HAVE BECOME CONTAMINATED (SC-11) for action to be taken.

B. Decontamination may be considered impractical for non-expendable items that are integral parts of equipment and not readily replaceable such as porus materials (e.g., wood and fiberglass), wire rope, chains, brushes, items with finned surfaces, and similar items where contamination may be embedded within the material configuration matrix. These items may not be released if detectable contamination is identified on the surface.

C. All tools, material, vehicles equipment accepted by FDF for disposition must have been cleaned to meet the visual inspection requirements defined in Specification Section 01517 and handled as defined in Specification Section 01120 and the Waste Management Plan located in Part 6 of the IFB/RFP.

3.3 QUALITY ASSURANCE

All QA requirements required to be met by the Subcontractor are stated in Part 9 of the IFB/RFP.

3.4 QUALITY CONTROL

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The Contractor shall perform or witness inspections and tests of procured material, equipment and items, work in progress and completed items within the bounds of the contract.

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TABLE 1 SURFACE CONTAMINATION LIMITS[a]

NUCLIDE[f]	FIXED PLUS REMOVABLE		REMOVABLE[b],[e]
	AVERAGE[b],[c]	MAXIMUM[b],[d]	
U-nat, U-235, U-238, and associated decay products, alpha emitters.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/100 cm^2	300 dpm/100 cm^2	20 dpm/100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/100 cm^2	3,000 dpm/100 cm^2	200 dpm/100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.	5,000 dpm /100 cm^2	15,000 dpm /100 cm^2	1,000 dpm /100 cm^2

(a) Where surface contamination by both alpha and beta-gamma emitting nuclides exists, the limits established for alpha and beta-gamma emitting nuclides should apply independently.

(b) As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

(c) Measurements of average contaminant should not be averaged over more than one square meter. For objects of less surface area, the average should be derived for each object.

(d) The maximum contamination level applies to an area of not more than 100 cm^2.

(e) The amount of removable radioactive material per 100 cm^2 of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface area is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

(f) The limits presented for transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, and Ac-227 may be adjusted on a case by case basis. Consult with Radiological Compliance when required to apply these limits for unrestricted release.

END OF SECTION